

We claim:

1. An apparatus for regulating the concentration of insulin within the blood of a living organism, wherein said apparatus is comprised of an in vitro cell culture for producing insulin, an in vitro cell culture for producing glucagon, an in vitro cell culture for producing somatostatin, means for measuring the concentration of glucose within the blood of such living organism, means for measuring the concentration of insulin within the blood of such living organism, means for delivering a specified amount of insulin to the blood of such living organism, means for delivering a specified amount of glucagon to the blood of such living organism, means for delivering a specified amount of somatostain to the blood of such living organism, and means for reducing the amount of insulin within such blood of such living organism.
2. The apparatus as recited in claim 1, wherein said apparatus further comprises means for withdrawing blood from a venous blood supply.
3. The apparatus as recited in claim 1, wherein said apparatus comprises means for detecting the presence of analytes in said venous blood supply.
4. The apparatus as recited in claim 3, wherein said apparatus is comprised of a controller comprised of means for determining the concentration of said analytes in said venous blood supply.
5. The apparatus as recited in claim 2, wherein said apparatus is comprised of means for reducing the amount of glucagon in the said venous blood supply.
6. The apparatus as recited in claim 1, wherein said apparatus is comprised of means for reducing the pH of said blood.

7. The apparatus as recited in claim 1, wherein said apparatus is comprised of means for increasing the pH of said blood.

8. The apparatus as recited in claim 3, wherein said apparatus is comprised of means for isolating analytes from said venous blood supply.

9. The apparatus as recited in claim 4, wherein said controller is an application specific integrated circuit controller.

10. The apparatus as recited in claim 1, wherein said apparatus is comprised of a cell culture assembly for producing analyte.

11. The apparatus as recited in claim 10, wherein said apparatus is comprised of a reservoir for storing said analyte.

12. The apparatus as recited in claim 11, wherein said apparatus is comprised of a first pump.

13. The apparatus as recited in claim 12, wherein said apparatus is comprised of a blood analyzer.

14. The apparatus as recited in claim 13, wherein said first pump withdraws blood from said blood supply and conveys it to a blood analyzer.

15. The apparatus as recited in claim 15, wherein said apparatus is comprised of a second pump.

16. The apparatus as recited in claim 15, wherein said apparatus is comprised of a culture media reservoir.

17. The apparatus as recited in claim 16, wherein said second pump withdraws blood from said blood supply and conveys it to said culture media reservoir.

18. The apparatus as recited in claim 17, wherein said apparatus is comprised of an isolator.

100-200-300-400-500-600-700-800-900-1000

15
16-18
V+4
15-18

19. The apparatus as recited in claim 18, wherein said apparatus is comprised of a third pump for extracting said analyte from said culture media reservoir and conveying said analyte to said isolator.

20. The apparatus as recited in claim 1, wherein said apparatus comprises a filter for purifying and isolating analytes.